**ACTIVITY 1**

**OH MY GAS!**

**Introduction**

Certain organisms possess the ability to capture solar energy and utilize it for the synthesis of organic compounds. This process which involves a series of enzyme-mediated complex reaction is photosynthesis. The organic compounds from photosynthesis would later serve as source of energy for the cells or as materials for building cellular components.

In this activity, you will be observing the taking-off and release of gases that is involved in the process of photosynthesis.

**Objective**

At the end of this activity you are expected to provide evidence that plants take-in and release-off gas molecules during the process of photosynthesis.

**PART A: GAS UPTAKE**

**Materials**

Water

*Hydrilla* sprig

Bromthymol blue

Straw

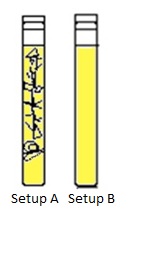
Beaker

Test tube

Light source

**Procedure**

1. Obtain a 250 mL beaker and fill it with 150 mL tap water. Place two to three drops of Bromthymol blue. Stir well with a strring rod. **Bromthymol blue is an indicator that changes color depending on the amount of carbon dioxide dissolved in solution.**
2. Introduce carbon dioixide in the solution by blowing a straw until a color change from blue to light yellow is observed.
3. Pour xxxx mL of the prepared water-Bromthymol blue solution in two test tubes. Label it test tubes A and B. For test tube A, add sprigs of *Hydrilla.*



1. Let the test tubes remain under bright sunlight or artificial light for 24 hours. Describe what happened to the setups.

**Guide Questions**

Q1. Describe what you observed in test tubes A and B after 24 hours.

Q2. Explain the reason behind the change in color that happened to the solution after 24 hours.

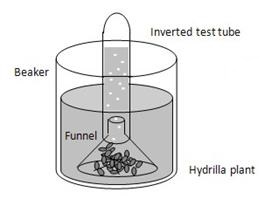
**PART B: GAS RELEASE**

**Materials**

* 1000 mL beaker
* 3 g sodium bicarbonate
* *Hydrilla* sprig
* Funnel
* Test tube

**Procedure**

1. Half-fill a 1000 mL beaker with tap water.
2. Add 3 g of sodium bicarbonate.
3. Place *Hydrilla* sprig in the bottom of the beaker.
4. Put a funnel over the plant, as shown:



1. Fill the test tube with water up to its brim. Secure the mouth of the test tube with your thumb. Invert the tube and place it on top of the funnel.
2. Place the beaker under a light source. Observe what will happen from the funnel with *Hydrilla* up to the inverted test tube.

**Guide Questions**

Q3. Describe what you observed in the test tube after placing it inverted on top of the funnel with *Hydrilla* inside?

Q4. What does the presence of bubbles represent? What is inside the bubbles?

Q5. The purpose of adding sodium bicarbonate powder is to increase the amount of carbon dioxide in the water. What is the role of carbon dioxide in the process of photosynthesis?

Q6. Discuss the exchange of gases happening during photosynthesis (discuss the uptake and release).

**ACTIVITY 2**

**BLOW IT UP!**

**Introduction**

Cellular respiration is a process of converting food molecule to an energy form that can be used. It has two types:

1. Aerobic Respiration- happens when oxygen is present
2. Anaerobic Respiration- happens even without oxygen, requires enzymes or microorganisms that can hasten the reactions.

The following activity will let you explore the process of cellular respiration by identifying the materials and products involved in this life energy process.

**Objective**

At the end of this activity you are expected to observe cellular respiration of yeast in an enclosed, fluid environment.

**Materials**

A packet of yeast

Erlenmeyer flask

Table sugar

Water

Latex balloon

**Procedure**

1. Fill two Erlenmeyer flasks with XXXX mL of water. Label the flasks with A and B.
2. Add one teaspoon of yeast to the two flasks and gently swirl the bottle a few seconds.
3. Add one teaspoon of table sugar to flask A and swirl it around some more. Below is the summary of the contents in each of the flasks:

Erlenmeyer flask A: water, yeast, and table sugar

Erlenmeyer flask B: water, and yeast

1. Stretch out the balloon and place the neck of the balloon over the neck of the Erlenmeyer flask. Do this to both of the setups.
2. Let the flasks sit in a warm place for about 20 minutes. Observe what will happen to the balloons.
3. Remove the balloon and take note the resulting smell of the solution.

**Guide Questions**

Q1. What happened to the balloon in the setup containing water, yeast, and sugar? How about in the setup with water and yeast only?

Q2. What do you think is inside the inflated balloon? Predict its possible identity.

Q3. Describe the smell of the resulting solution and compare it to a commercial beverage.

Q4. The experiment is an example of a cellular respiration taking place, is the setup an example of aerobic respiration or anaerobic respiration? Why do you say so?

Q5. What is/are the starting material/s of anaerobic respiration?

Q6. What is/are the end product/s of anaerobic respiration?

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